ITEM 27 FY93
04DS31
31 May 1991

PURCHASE DESCRIPTION

SIGNAL GENERATOR (10 kHz to 520 MHz)

FSNFV-A

1.0 GENERAL DESCRIPTION This procurement requires a solid-state, synthesized signal generator covering the frequency range of 10 kHz to 520 MHz; output level continuously adjustable from +13 to -127 dBm; CW operation or AM/FM capability from either an internal or external source. In addition it shall have a deviation meter capable of measuring FM deviation on externally applied input signals from 30 to 500 MHz.

2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800( ), Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications with the following exceptions:

a. The Electromagnetic Interference requirements of MIL-T-28800( ) are limited to CE01, CE03, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (relaxed 20 dB; back panel search excluded), RE02 (14 kHz to 10 GHz), and RS03.

b. The warm-up time is extended to 2 hours.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics

3.1.1 Range: At least 10 kHz to 520 MHz

3.1.2 Resolution: At least 10 Hz; digital readout

3.1.3 Accuracy: Same as reference standard

3.1.4 Reference

3.1.4.1 Internal: 10 MHz, less than 0.5 ppm per hour after 2 hour warm-up
3.1.4.2 External: Accepts 10 MHz TTL compatible

3.1.5 Spectral Purity (equal to or better than limits specified below)

3.1.5.1 Harmonics/Sub-Harmonics: -26 dBc from 10 kHz to 10 MHz; -30 dBc from 10 to 520 MHz
3.1.5.2 Non-harmonics/Spurious: -35 dBc
3.1.5.3 Residual FM (50 Hz to 15 kHz post detection bandwidth): Less than 200 Hz peak
3.1.5.4 Residual AM (50 Hz to 15 kHz post detection bandwidth): At least -60 dBc

3.2 Output Characteristics

3.2.1 Range: +13 to -127 dBm (1 volt to 0.1 microvolt)

3.2.2 Accuracy: ±2.5 dB of actual measured output level

3.2.3 Display (Digital)

3.2.3.1 Units: Both dBm and volts
3.2.3.2 Resolution: 0.1 dB or better

3.2.4 Output Impedance: 50 ohms

3.2.4.1 Connector: Type-N female
3.2.4.2 SWR: Less than 1.3 at RF outputs below -10 dBm

3.3 Modulation Characteristics

3.3.1 Amplitude Modulation (AM)

3.3.1.1 Internal AM
3.3.1.1.1 Rate: At least 400 Hz and 1 kHz; both ±5%
3.3.1.1.2 Depth: 0 to 99%; display accurate to within ±6%
3.3.1.1.3 Distortion: Less than 5% at 50% depth and 1 kHz rate

3.3.1.2 External AM
3.3.1.2.1 Rates: 10 Hz to 20 kHz
3.3.1.2.2 Depth: 0 to 99%
3.3.1.2.3 Distortion: Less than 5% at 50% depth and 1 kHz rate
3.3.1.2.4 Input Level: Less than 10 V peak-to-peak into 600 ohms

3.3.2 Frequency Modulation (FM)

3.3.2.1 Internal FM
3.3.2.1.1 Rate: At least 400 Hz and 1 kHz; both ±5%
3.3.2.1.2 FM Deviation: 0 to 500 kHz peak
3.3.2.1.2.1 Ranges: At least 0 to 50 kHz for carrier frequencies between 0.1 and 5 MHz; at least 0 to 500 kHz for carrier frequencies above 5 MHz
3.3.2.1.3 Deviation Error: ±5% of deviation at 1 kHz (excluding residual FM)

3.3.2.2 External FM
3.3.2.2.1 Rates: 50 Hz to 100 kHz
3.3.2.2.2 FM Deviation: 0 to 500 kHz peak
3.3.2.2.2.1 Ranges: At least 0 to 50 kHz for carrier frequencies between 0.1 and 5 MHz; at least 0 to 500 kHz for carrier frequencies above 5 MHz
3.3.2.2.3 Deviation Error: ±5% of deviation at 1 kHz (excluding residual FM)
3.3.2.2.4 Input Level: Less than 10 V peak-to-peak into 600 ohms

3.4 FM Deviation Meter

3.4.1 Frequency Input Range: 30 to 500 MHz

3.4.2 Input Signal Level: 15 millivolts to 5 volts rms

3.4.3 Input Impedance: 50 ohms

3.4.4 Measurement Range: 0 to 500 kHz

3.4.4.1 Polarity: Selectable positive or negative
3.4.4.2 Modulation Rate: 100 Hz to 8 kHz
3.4.4.3 Accuracy: 6% of full scale from 100 Hz to 8 kHz

4.0 GENERAL REQUIREMENTS

4.1 Power: 115/230 Vac ±10% single phase, 50, 60 or 400 Hz, 100 watts maximum

4.2 Dimensions: The total volume of the unit shall not exceed 37,200 cm^3 (2,270 in^3) with a maximum height of 6.0 inches.

4.3 Weight: The overall weight of the unit shall not exceed 18.2 kg (40 lb).

4.4 Calibration Interval: The calibration interval shall be 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.5 Remote Operation: The unit will be capable of remote operation via IEEE-488 bus interface. At a minimum it shall operate as a listener such that all major functions except the power on/off switch are controllable and shall have, as a minimum, the following subset of GPIB commands: AH1, SH1, L4.

4.6 Reverse Power Protection: Resettable RF circuit breaker up to inputs of 50 watts